

What is claimed is:

1. An optical dispersion monitoring apparatus for monitoring dispersion based on a waveform of an input optical signal, comprising:
 - a characteristic amount detecting section selectively detecting a physical amount corresponding to a location where waveform distortion occurring depending on dispersion appears distinctively in the waveform of said input optical signal; and
 - a dispersion information extracting section extracting information related to the dispersion occurred in said optical signal, based on a comparison between the physical amount detected in said characteristic amount detecting section and a reference value indicated by a reference signal, to output the information.
2. An optical dispersion monitoring apparatus according to claim 1,
 - wherein said characteristic amount detecting section includes; a light receiving section converting said input optical signal into an electrical signal; and a signal transition position detecting section detecting the voltage level corresponding to at least one of a rising edge and a falling edge of waveform of the electrical signal converted in said light receiving section, and
 - said dispersion information extracting section compares the reference value indicated by the reference signal with the voltage level detected in said signal transition position detecting section, and outputs a signal corresponding to the comparison result as dispersion information.
3. An optical dispersion monitoring apparatus according to claim 2,
 - wherein said signal transition position detecting section detects the voltage level corresponding to crossing points in an eye pattern of the electrical signal converted in said light receiving section.
4. An optical dispersion monitoring apparatus according to claim 3,
 - wherein said signal transition position detecting section includes: a comparator which receives the electrical signal converted in said light receiving section at one input terminal thereof; a slice amplifier which amplifies a signal output from said comparator; and a low-pass filter which smoothes a signal output from said slice amplifier to feedback it to the other input terminal of said comparator, and the signal transmitted through said low-pass filter is supplied to said dispersion

information extracting section as the voltage level corresponding to said crossing points.

5. An optical dispersion monitoring apparatus according to claim 1,
wherein said characteristic amount detecting section includes: a light receiving section converting said input optical signal into an electrical signal; and a signal intensity detecting section detecting the average intensity of waveform of the electrical signal converted in said light receiving section, by sampling parts of the waveform at the center of one cycle and locations neighboring the center in accordance with a clock signal synchronized with said input optical signal, and
said dispersion information extracting section compares the average intensity detected in said signal intensity detecting section with the reference value indicated by said reference signal, and outputs a signal corresponding to the comparison result as dispersion information.
6. An optical dispersion monitoring apparatus according to claim 5,
wherein said signal intensity detecting section includes: a selector circuit which performs a switching operation in accordance with said clock signal to selectively output the electrical signal converted in said light receiving section; and a low-pass filter which smoothes a signal output from said selector circuit and outputs a signal indicating the average intensity.
7. An optical dispersion monitoring apparatus according to claim 6,
wherein said signal intensity detecting section includes a duty adjusting circuit which adjusts a duty of the clock signal supplied to said selector circuit.
8. An optical dispersion monitoring apparatus according to claim 5,
wherein said signal intensity detecting section includes: a comparator which compares the electrical signal converted in said light receiving section and said reference signal; a sample and hold circuit which samples a signal output from said comparator in synchronization with said clock signal; and a low-pass filter which smoothes a signal output from said sample and hold circuit and outputs a signal indicating the average intensity.
9. An optical dispersion monitoring apparatus according to claim 5,

wherein said signal intensity detecting section includes: a first comparator which compares the electrical signal converted in said light receiving section and a reference signal whose level is a predetermined value higher than said reference signal; a first sample and hold circuit which samples a signal output from said first comparator in synchronization with said clock signal; a low-pass filter which smoothes a signal output from said first sample and hold circuit and outputs a signal indicating the average intensity; a second comparator which compares the electrical signal converted in said light receiving section and a reference signal whose level is a predetermined value lower than said reference signal; and a second sample and hold circuit which samples a signal output from said second comparator in synchronization with said clock signal, and

said dispersion information extracting section includes: a NAND circuit which calculates the NAND of an inverse signal of the signal sampled by said first sample and hold circuit, and the signal sampled by said second sample and hold circuit; and a switching circuit which controls an output condition of dispersion information in accordance with the calculation result of said NAND circuit.

10. An optical dispersion monitoring apparatus according to claim 5,
wherein said signal intensity detecting section includes a phase adjuster for adjusting a phase of said clock signal to be used when sampling a signal.
11. An optical dispersion monitoring apparatus according to claim 1,
wherein said dispersion information extracting section sets said reference signal depending on a mark ratio of said input optical signal.
12. An optical dispersion monitoring apparatus according to claim 11,
wherein said dispersion information extracting section sets said reference signal so as to follow a change in power setting of said input optical signal.
13. An optical dispersion monitoring apparatus according to claim 11,
wherein said dispersion information extracting section sets said reference signal so as to be approximately coincident with the physical amount detected in said characteristic amount detecting section when the dispersion is zero.
14. An optical dispersion monitoring apparatus according to claim 13,

wherein said dispersion information extracting section comprises a circuit which adds an offset signal to said reference signal.

15. A method of monitoring optical dispersion for monitoring dispersion based on a waveform of an input optical signal, comprising:

selectively detecting a physical amount corresponding to a location where waveform distortion occurring depending on dispersion appears distinctively in the waveform of said input optical signal; and

extracting information related to the dispersion occurred in said optical signal, based on a comparison between said detected physical amount and a reference value indicated by a reference signal.

16. An optical transmission system provided with a variable dispersion compensator on a transmission path through which an optical signal is propagated, for controlling a compensation amount of said variable dispersion compensator to dynamically compensate for dispersion, wherein

using the optical dispersion monitoring apparatus in claim 1, dispersion occurred in the optical signal being propagated through said transmission path is monitored and the compensation amount of said variable dispersion compensator is controlled in accordance with said monitored result.

17. An optical transmission system according to claim 16, further comprising:

an error monitoring apparatus for measuring an error rate of the optical signal propagated through said transmission path; and a monitor switching apparatus for selectively switching respective monitored results of said optical dispersion monitoring apparatus and said error monitoring apparatus, and

the compensation amount of said variable dispersion compensator is controlled in accordance with the monitored result selected by said monitor switching apparatus.